achieved at the expense of radius, and therefore, wall tension, in the ovine model with induced ischemic cardiomyopathy.

TCT-83

What Amount of Intravenous Fluid Produces Maximum Hemodynamic Benefit in Tamponade Patients

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Background: In patients of tamponade, interim measures may occasionally be needed when facilities for pericardial fluid drainage are not immediately available. Intravascular volume expansion is the most commonly advocated measure but with limited scientific data.This study was undertaken to ascertain an optimum amount of fluid that can produce the maximum benefit in tamponade patients.
Methods: Patients ≥ 16 years of age with large circumferential pericardial effusion, and showing echocardiographic evidence of cardiac tamponade were included. Hemodynamically unstable patients; those with structural heart diseases; pregnant females and those undergoing hemodialysis were excluded. SBP and CO were measured using Edwards Life Sciences Vigilance II monitor , Swan Ganz CCO catheter and arterial access; at baseline and after each 250 ml of fluid over 5 min (totalling to 1000 mL in 20 min). The entire fluid was drained at the end of the procedure.
Results: A total of 28 patients constituted the study group; all of whom exhibited an improvement in hemodynamic parameters (SBP, CO) with volume expansion. Significant ($p < 0.05$) increase in SBP, DBP, CO and CI values occurred upto 250-500 ml bracket; above which the significance was lost.
Conclusions: Rapid infusion of as little as 250 ml of intravenous normal saline may improve the cardiac hemodynamics in a significant proportion of tamponade patients.

Angiography and QCA

Washington Convention Center, Lower Level, Hall A

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TCT-84

Prospective, Online, Interactive Survey Comparing Visual Lesion Estimation To Quantitative Coronary Angiography

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Background: Inaccurate lesion measurement and inappropriate stent length selection can negatively affect clinical outcomes following coronary stent deployment. Measurement errors resulting in longitudinal geographic miss or the use of inappropriately long stents have been associated with restenosis and the need for target lesion revascularization. This study evaluated interventional cardiologists' (IC) ability to measure lesions and select stent lengths.
Methods: This evaluation was conducted as a prospective, online, interactive survey of 25 matched orthogonal angiographic images that were pre-scored using quantitative coronary angiography (QCA). Participants provided estimates of lesion length and stent length selection. These estimates were compared to the maximum QCA value. A 2-4 mm stent overlap of both the proximal and distal lesion edges was considered to be optimal. Based on this, lesion lengths measurements >1 mm below and >4 mm above and stent lengths that were less than 4 mm and >8 mm from the QCA value were considered to be short and long, respectively. Five of the 25 images were repeated to assess intra-rater variability.
Results: Forty ICs participated. The results are summarized in Table 1. Accurate lesion length measurement and stent length selection occurred in only 30.4% and 22.3% of the cases, respectively. Stent length misses that would fail to cover the entire lesion comprised 23.8% of the cases. Analysis of repeated images showed a >3mm difference in 38.5% and 37.5% of length measurements and stent length selections, respectively.

Table 1. Evaluator Lesion Length Measurement and Stent Length Selection Relative to QCA

	Short	Accurate	Long
Lesion Length Measurement	409 (51.1%)	243 (30.4%)	152 (19.0%)
	47.6%, 54.6%	27.2%, 33.7%	16.3%, 21.9%
Stent Length Selection	440 (55.0%)	178 (22.3%)	182 (22.8%)
	51.5%, 58.5%	19.4%, 25.3%	19.9%, 25.8%

N (percent of total)
95% confidence interval

Conclusions: Manual assessment of the coronary lesion length has a high degree of inter-rater and intra-rater variability, which may lead to inadequate stent selection and lesion treatment. Employing methodology to improve the accuracy of lesion measurement may improve patient outcomes.

TCT-85

Factors Influencing Stent Recoil and Underexpansion In Vivo Independent of Atherosclerosis: A Multimodality Imaging Study in Normal Porcine Coronary Arteries

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Background: Stent underexpansion and malapposition continue to be important factors in suboptimal outcomes of stent treatment of obstructive coronary disease. It is well established that stents rarely achieve intended post-implant diameters that would be expected from the maximum applied pressure and the stent pressure-diameter characteristics provided by the manufacturer. In human arteries, the restrictive forces preventing the stent from fully expanding are attributed to the rigidity and heterogeneous composition of atherosclerotically damaged wall, calcifications in particular. We sought to examine the true in-vivo stent recoil in response to elastic forces posed by healthy porcine arteries.
Methods: One hundred fifty eight stents were implanted in coronary arteries in swine model aiming at an 120% overstretch ratio. Final minimum stent diameter (MSD) immediately post-deployment was measured by QCA (XIENCE=39, RESOLUTE=41, OMEGA=42), intravascular ultrasound (IVUS) (LIBERTE =23, PROMUS =16) and optical coherence tomography (OCT) (XIENCE=12). In 122 stents examined by QCA, minimum balloon diameter (MBD) during stent deployment was also measured. For each stent, MSD was compared to the projected diameter (PD) that the stent was to achieve per compliance chart at the pressure used.
Results: The average MSD by QCA was 7.9±8.3% lower than the PD expected from the compliance chart at the pressure used. IVUS and OCT demonstrated similar deficit of MSD in comparison to PD (7.1±5.7% by IVUS and 9.4±4.8% by OCT). MBD was only 2.5±6.4% lower than PD, thus accounting for ~1/3 of the deficit, while ~2/3 was due to true recoil. Stent type, coronary branch location (RCA, LAD or LCX), baseline artery size (reference diameter), tapering of the stented segment and the actual overstretch ratio had no evident impact on the magnitude of deficit/recoil.
Conclusions: Elastic resistance of normal porcine coronary arteries is sufficient to induce acute stent recoil significantly beyond the typical manufacturer's claim of less than 3% based on bench testing in air with no external resistance. As a consequence, stents consistently achieve 7-10 % less than the predicted diameter, even in complete absence of atherosclerosis.

TCT-86

Quantification and Impact of the Proportion of Coronary Disease Burden Treated by Percutaneous Coronary Intervention: The SYNTAX Revascularization Index

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Background: The extent of coronary artery disease (CAD), as quantified by the baseline SYNTAX Score (bSS) and the residual SS (rSS) after PCI, have been shown to be associated with adverse ischemic outcomes in various studies. We sought to quantify the proportion of CAD burden treated by PCI and to evaluate its impact on 1-year adverse ischemic events, using a newly developed index (the SYNTAX Revascularization Index; SRI).
Methods: The bSS and rSS from 2,681 angiograms from patients enrolled in the prospective ACUITY (Acute Catheterization and Urgent Intervention Triage Strategy) trial were determined. The SRI was then calculated for each patient by the following formula [1-(rSS/bSS)] x 100. Patients were then stratified and outcomes examined according to the proportion of revascularized myocardium (SRI=100% (complete revascularization), 50-99% and < 50%).
Results: The mean bSS was 12.8 ± 6.7, and after PCI the mean rSS was 5.6 ± 2.2. The SRI was 100% in 1079 patients (40.2%) 50-99% in 908 patients (33.9%), and < 50% in 694 patients (25.9%). One-year adverse outcomes, including death, were inversely proportional to the SRI (Table). By multivariable analysis, SRI was found to be an independent predictor of 1-year mortality (hazard ratio (HR) = 0.48 [95%CI 0.24, 0.95], P=0.03). An SRI cutoff of < 80% (present in 1287 (48.0%) of patients after PCI) had the best prognostic accuracy for risk prediction of death (AUC 0.60, [95%CI 0.53, 0.67] p=0.004).

Conclusions: The SRI is a newly described method for quantifying the proportion of CAD burden treated by PCI. Given its correlation with mortality, and pending external validation, the SRI may be useful in assessing the degree of revascularization after PCI, with SRI ≥80% a "reasonable" goal.

One-year Outcomes According to SYNTAX Revascularization Index

	SRI 100%	SRI 50-99%	SRI <50%	P-value all groups
Death	15 (1.4)	24 (2.7)	25 (3.7)	0.009
Cardiac death	4 (0.4)	18 (2.0)	13 (1.9)	0.002
Myocardial infarction	75 (7.1)	97 (10.8)	71 (10.4)	0.006
Unplanned revascularization	109 (11.0)	99 (11.4)	89 (13.4)	0.14
Definite/probable ST	12 (1.1)	17 (1.9)	13 (2.0)	0.29
Death/ myocardial infarction	86 (8.2)	110 (12.3)	88 (12.9)	0.001
Major adverse cardiac events	167 (16.4)	171 (19.2)	144 (21.3)	0.009

Data presented as n (%); Major adverse cardiac events (MACE) is the composite rate of death, myocardial infarction, or unplanned revascularization. MI=myocardial infarction; SRI=SYNTAX Revascularization Index; ST=stent thrombosis.

TCT-87

Frequency And Impact Of Intraprocedural Thrombotic Events During Percutaneous Coronary Intervention In Women Compared To Men: Pooled Analysis From The ACUITY And HORIZONS-AMI Trials

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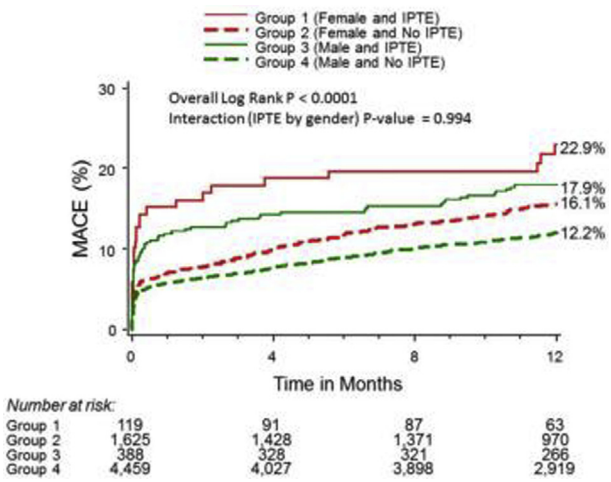
Background: Women have greater morbidity and mortality after myocardial infarction (MI) than men. Whether this is due to more severe comorbidities or inherent biologic differences is unsettled. Specifically, women have been shown to have higher platelet reactivity, but whether a greater thrombotic tendency contributes to gender differences in outcome is unknown.
Methods: Intraprocedural Thrombotic Events (IPTE), defined as new/increasing thrombus, abrupt vessel closure, no/slow reflow, or distal embolization, were evaluated in 6,591 patients undergoing stenting in a pooled analysis from the ACUITY and HORIZONS-AMI trials of patients with non-ST-segment elevation acute coronary syndromes and ST-segment elevation MI. Quantitative coronary angiographic analysis was blinded to treatment and outcomes.
Results: IPTE was identified in 507 patients (7.7%), with 119/1744 (6.8%) occurring in women and 388/4847 (8.0%) in men (p=0.12). Rates of MACE (Death, MI, unplanned target lesion revascularization for ischemia) and major bleeding were higher in women (p< 0.001) and in patients with IPTE (p< 0.001). However, the risk of MACE associated with IPTE was nearly identical among women [HR (95%CI) = 1.6 (1.0-2.4), p=0.03] and men [HR = 1.6 (1.2-2.0), p< 0.001] (Figure). Similar results were found for major bleeding. There was no interaction between IPTE and gender for 1-year MACE (p=0.99) and 30-day bleeding (p=0.50).



Conclusions: In acute coronary syndromes, IPTE is not uncommon and occurs at similar frequency in both men and women. The adverse impact of IPTE on ischemic and bleeding risk is also independent of sex.

TCT-88

The Clinical Outcomes of Peri-contrast Staining (PSS) after Second Generation DES Implantation

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Background: Several studies showed peri-contrast staining (PSS) after silorimus-eluting stent was be associated with target-lesion revascularization (TLR) and very late stent thrombosis. However, the incidence and clinical sequela of PSS after second generation DES implantation are unclear, so we retrospectively evaluate the clinical outcomes.
Methods: This study consisted of de novo 2301 lesions in 1743 patients that were treated with second generation DES (zotarolimus-eluting stent: ZES, everolimus-eluting stent: EES, and biolimus-eluting stent: BES). They were evaluated by follow-up angiography within 12 months after stent implantation, from April 2009 to February 2013. We divided into PSS group and non-PSS group and compared the two groups in clinical and angiographical outcomes.
Results: We had obtained 1872 lesions follow-up angiography. (81.3%) The mean clinical follow up period was 610±13 days. Baseline clinical and angiographic characteristics were similar between the two groups. (N.S.) Late acquired PSS was observed in 16 lesions (0.85%). In these lesions, 2 lesions (0.73%) were observed in BES, 7 lesions (0.67%) were EES and 7 lesions (1.62%) were ZES. (N.S.) Stent fracture (SF), tortuosity, and lesions with severe angulation (>45°) were more frequently observed in lesions with PSS than in lesions without PSS (31.3% versus 1.1%, p< 0.0001, 12.5% versus 1.3%, p=0.002, 18.8% versus 1.7%, p=0.02). Cumulative incidence of TLR and MACE in the PSS group was higher than that in the non-PSS group. (33.3% versus 5.4%, p=0.003, and 41.7% versus 9.3%, p=0.003). There was no significant difference in late and very late stent thrombosis between the two groups. (N.S.) After multivariable analysis, CTO (OR: 4.07, 95% CI: 1.1 to 12.1, p=0.04), and reference diameter (>2.83mm) (OR: 4.17, 95% CI:1.5 to 12.4, p = 0.005) were independent predictors for PSS.
Conclusions: PSS after second generation DES was a rare phenomenon but appeared to be associated with subsequent TLR.

TCT-89

Left Ventricular Global Function Index: Relation with Infarct Characteristics and Left Ventricular Ejection Fraction after STEMI

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Background: The left ventricular global function index (LVGFI) is a novel indicator of left ventricular performance. Its role in patients after acute myocardial infarction is unknown. We sought to investigate the relationship between the LVGFI and infarct characteristics as well as left ventricular ejection fraction in patients after acute ST-segment elevation myocardial infarction (STEMI).
Methods: 226 patients with first STEMI (mean age 57 ± 11 years) were enrolled in this observational study. All patients underwent cardiac magnetic resonance (CMR) imaging within the first week after STEMI. Infarct characteristics were determined with the use of late gadolinium enhanced images. Left ventricular dimensions and function were measured by cine true-FISP sequences.
Results: The mean LVGFI was 32 ± 8 %. LVGFI was inversely related with peak creatine kinase (r = -0.46), peak cardiac troponin T (r = -0.45) and CMR-determined infarct size (r = -0.42, all p < 0.001). Significantly decreased LVGFI values were also observed in patients with microvascular obstruction and anterior STEMI (all p < 0.001). In addition, there was a strong correlation between LVGFI and left ventricular ejection fraction (r = 0.91, p < 0.001).
Conclusions: This study demonstrates that the LVGFI is significantly associated with infarct characteristics and left ventricular ejection fraction in patients after acute STEMI. LVGFI is a useful functional parameter of the left ventricle. Future studies are needed to evaluate its role as a prognostic marker in this population.